

moving the air, in the brown scales. In the white scales the bands usually start out from or beneath the marginal longitudinal stria of the upper side of the scale, and extend beneath the other lon-

gitudinal striae toward the middle of the scale (see fig. 7, *b* and *c*): exceptionally, however, they begin beneath one of the other longitudinal striae.

(*To be continued.*)

## HOMINIVOROUS HABITS OF *LUCILIA MACELLARIA*, "THE SCREW-WORM."

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I have from time to time had occasion to note the depredations of the screw-worm upon horses and cattle in this state, but until recently have not received positive evidence of its attacks upon human subjects in any locality so far north as Kansas. But early in September, 1882, I received from Mr. S. D. Osborn, the postmaster at Vareck, in Southeastern Kansas, specimens "of the worms which came from the nostrils of Milton Carter." These proved to be the larvae of *Lucilia macellaria* Fab., the so-called "screw-worm." Upon further inquiry I learned that upwards of one hundred full-grown maggots escaped from the nose of this patient, who finally recovered from the serious illness consequent upon their ravages. I also ascertained that Mr. Carter had long been afflicted with an offensive nasal catarrh, which made his nostrils an attractive place for the oviposition of the fly, and that he had fallen asleep in the woods in the daytime only a few days before the first appearance of the symptoms produced by the presence of the larvae.

Several other instances of the attacks of *Lucilia* upon man soon came to my knowledge, most of which led to fatal results. Among these I will select the case attended by Dr. J. B. Britton, of Mapleton, in southeastern Kansas, who reported it in full at the session of the Southeast Kansas District Medical Society, in January, 1883. From this report I condense the following account: "On the evening of August 22d, 1882, Mr. M. E. Hudson complained of a peculiar sensation at the base of the nose and along the orbital processes, which was first followed by inordinate sneezing, and later by a most excruciating pain over the os frontis, also involving the left superior maxillary. This patient also had suffered, and was still suffering, from an aggravated form of nasal catarrh. The discharge was quite purulent, of a yellowish color frequently tinged with blood, with a disagreeable odor and at times intolerably offensive. On the 24th there was a profuse discharge of much purulent matter from the nostril and mouth, when all pain instantly

subsided. This discharge continued for three days, during which time as much as sixteen ounces escaped, increasing in consistency until it was pure pus. The odor becoming much more offensive, his cough was more troublesome and fever increased to such an extent as to produce slight delirium for twelve hours. What was thrown off was with much difficulty expectorated, and was sanious, containing microscopic particles of osseous matter, together with flakes of plastic exudation. The os hyoides was evidently destroyed. The patient had spoken with difficulty for thirty-six hours and there was much trouble in swallowing. The soft palate had evidently given way and there was an entire inability to protrude the tongue or use it in speech.

••About this time a worm similar to a maggot dropped from his nose. That was the first indication or suspicion that there was anything of the kind present. There was not, as in some other cases reported, any swelling, or movements traceable under the skin, nor was there at any time any complaint of the patient, calculated to lead to a knowledge of their presence. After the appearance of the first, I expected more, and was surprised to see them drop from the nostrils and wiggle from the mouth without any discomfort to the patient until they came in contact with the Schneiderian membrane, when they annoyed him greatly, and every effort was made on his part to expel them; but so soon as expelled, no further trouble was manifested until another

would get into the nostril. Every effort was made on my part to discover them under the tissue, but the soft palate being destroyed to a great extent, and the palatine arch apparently lowered, it was with much difficulty that an examination could be made. The worms were evidently burrowing under the palatine fascia, as it presented a honey-combed appearance and in places patches were totally destroyed as large as a dime [18 mm.]. They continued to drop from the mouth and nose, forced from the nostrils by the efforts of the patient, for the following forty-eight hours, during which time 227 were counted and the estimated number exceeded 300. At this time the whole of the soft palate was destroyed. The patient lived four days after the last worm came away.

••I put five of the worms in dry earth and in fourteen days from the time they dropped from the nostril there hatched out three flies.

••Upon a very minute and careful examination after death I was astonished to find that all the tissue covering the cervical vertebrae, as far down as I could see by throwing the head back and compressing the tongue, was wholly destroyed and the vertebrae exposed. The palatine bones broke with the slightest pressure of the finger. The os hyoides was destroyed and the nasal bones loose, only held in position by the superficial fascia.

••My own theory is that the fly deposited the eggs while the patient was asleep, probably the day previous to

the peculiar sensation and sneezing first complained of. At that time they had acquired vitality enough to annoy him while in contact with the sound flesh. So soon as they came in contact with the unsound flesh, or that affected with the catarrh, being as it must have been gangrenous, they gave no further trouble."

Dr. Britton forwarded to me specimens of the fly, bred as above stated, which I identified as *Lucilia macellaria* Fab. In order, however, that there might be no possibility of error, I submitted them to Dr. S. W. Williston, of New Haven, Conn., who corroborated this determination and furnished the following notes concerning the species: "The specimens are evidently *Lucilia* (*Campomyia*) *macellaria* Fab., a fly common from the Argentine Republic to Canada, and which from its variations has probably received more specific names (20!) than any other American fly. It belongs to the *Muscidae* (true) and is not far from *Musca*. Their hominivorous propensities have gained for them the synonyms of *Lucilia hominivorax* Coquerel, and *L. hominivorus* Cenic (S. America)."

In the Peoria (Ill.) Medical Monthly for February, 1883, Dr. Joshua Richardson, of Moravia, Iowa, has an article upon "The screw-fly and its ravages," from which I make the following extracts: "While travelling in Kansas in the latter part of last August a citizen of this place had the misfortune to receive while asleep a deposit of eggs from this fly. He had been troubled

for years with catarrh, hence the attraction to the fly. He returned home a few days after the accident and shortly after began complaining of a bad cold. Growing rapidly worse, I was called to attend him. Monday, my first day, his appearance was that of a man laboring under a severe cold. Had slight congestion of the lungs, and moderate grade of fever. His nose seemed greatly swollen and he complained of a smarting, uneasy feeling in it, and general misery through the head. Gave him treatment to relieve the congestion and fever. Tuesday saw him again. His nose and face were still more swollen, and in addition to the other symptoms he was becoming slightly delirious and complained a great deal of the intense misery and annoyance in his nose and head. A few hours after, I was sent for in haste with the word that something was in his nose. I found on examination a mass of the larvae of this fly (or "screw-worms" as they are commonly called in the south) completely blocking up one nostril. On touching them they would instantly retreat *en masse* up the nostril. Making a 20 per cent solution of chloroform in sweet milk I made a few injections up both nostrils, which immediately brought away a large number, so that in a few hours I had taken away some 125 of them. By Wednesday evening erysipelas had begun, implicating the nose and neighboring portions of the face. Another physician was called. By continual syringing with a strong antiseptic solution of

salicylate of soda, bicarbonate of soda and carbolic acid we hoped to drown out the remaining larvae. But they had by this time cut their way into so many recesses of the nose and were so firmly attached that we were unable to accomplish much. Finally we resorted to the chloroform injections, which immediately brought away a considerable number. Friday I was able to open up two or three canals that they had cut, extracting several more that had literally packed themselves one after another in these fistulous channels. His speech becoming suddenly much worse, I examined the interior of his mouth and found that a clear-cut opening had been made entirely through the soft palate into his mouth and large enough to insert the end of a common lead pencil. Saturday the few remaining larvae began changing color and one by one dropped away. On Sunday for the first time hemorrhage from both nostrils took place, which continued at intervals for three days but was not at any time severe. On this day the patient began to improve, the delirium and erysipelas having subsided, leaving but little or no annoyance in his head. In a few days he became able to go about home, and even to walk a distance of half a mile to visit a friend and return. But while there he began complaining of a pain in the neighborhood of his left ear, apparently where the eustachian tube connects with the middle ear. It proved to be an abscess. Being already so reduced by the first attack, he was unable to withstand the

second, and died after an illness of nearly three weeks, completely exhausted by his prolonged sufferings. Three days before his death the abscess discharged its contents by the left nostril. The quantity of pus formed was about 2½ ounces [78 grams].

"In all about 250 larvae were taken away from him during the first attack, and, as the visible results, not only had they cut the hole through the soft palate, but had also eaten the cartilage of the septum of the nose so nearly through as to give him the appearance of having a broken nose. The case occupied, from the first invasion of the fly to its final result, nearly two months. He doubtless would have recovered but for the formation of the abscess, which, from all the symptoms, was caused by one or more of the larvae having found their way up the left eustachian tube."

Dr. Richardson also quotes the Rev. William Dixon, of Green, Clay Co., Kansas, as giving the following account of his own experience:

"While riding in his buggy a few years ago in Texas, a screw-fly attacked him flying up one nostril. He blew it out, when it dashed up the other and deposited its eggs before he was able to expel it. Not realizing the danger he did nothing for about three days, when the pain became so great that he hastened to Austin to consult a physician. His soft palate was almost destroyed before the larvae, over 200 in number, were expelled." This was the only one of twelve cases known to Dr. Richardson in which the patient recovered.